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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David A. Brown

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EXAMINER

SHINGLES, KRISTIE D

ART UNIT

PAPER NUMBER

2141

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/886,659	<b>Applicant(s)</b> BROWN, DAVID A.	
	<b>Examiner</b> KRISTIE D. SHINGLES	<b>Art Unit</b> 2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### Response to Amendments

Claims 1, 5, 8, 12, 15, 19 and 22-24 have been amended.

Claims 1 - 25 are pending.

### Response to Arguments

I. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new grounds of rejection.

### Claim Rejections - 35 USC § 103

II. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

III. **Claims 1-3, 8-10, 15-17 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wilkinson III et al* (US 6,014,659) in view of *Lee et al* (US 6,513,028).**

a. **Per claim 23, *Wilkinson III et al* teach an apparatus for providing a route index corresponding to a search key comprising:**

- a forwarding engine which receives the search key and provides a portion of the search key as a mapper key (*col.7 line 48-col.8 line 25; forwarding engine receives search key and provides fragments of the search key as mapper key for the search unit*); and

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- a lookup table coupled to the forwarding engine, which receives the mapper key from the forwarding engine, the lookup table comprising (*col.17 line 59-col.18 line 8, col.19 lines 17-21*):
- a plurality of mappers which are indexed by successive portions of a search key and partial indexes from prior mappers to output the route index to the forwarding engine for the search key or to output partial indexes to subsequent mappers (*col.5 line 33-col.6 line 29, col.8 lines 40-47, col.27 lines 44-57*); and

Yet *Wilkinson III et al* teach multiple successive portions of the search key (*col.8 line 40-col.9 line 26*), yet fail to explicitly teach a partial index feedback loop by which a series of mappers is indexed in multiple passes with multiple successive portions of the search key. However *Lee et al* teach a system of searching that involves feeding back search key entries as different feedback keys for searching through the indexed entries (*col.3 line 44-col.4 line 28, col.7 lines 28-67, col.8 lines 23-59*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of *Wilkinson III et al* and *Lee et al* for the purpose of implementing a feedback loop which allows for the use of search results from previous operations to be "fed back" into the system for generating subsequent search keys, which offers an improved searching capabilities that minimize qualifying non-matching search entries.

b. **Claims 1, 8, 15 and 22** contain limitations that are substantially equivalent to the limitations of claim 23 and are therefore rejected under the same basis.

c. **Per claim 2**, *Wilkinson III et al* and *Lee et al* teach the lookup table as claimed in Claim 1, *Lee et al* further teach wherein the route index corresponding to the search key is stored in a single location in one of the plurality of mappers (*col.5 lines 13-33 and 61-65*).

d. **Claims 9 and 16** are substantially similar to claim 2 and are therefore rejected under the same basis.

e. **Per claim 3**, *Wilkinson III et al* and *Lee et al* teach the lookup table as claimed in Claim 1, *Wilkinson III et al* further teach wherein the length of the search key is variable (*col.28 lines 5-13*).

f. **Claims 10 and 17** are substantially similar to claim 3 and are therefore rejected under the same basis.

g. **Per claim 24**, *Wilkinson III et al* and *Lee et al* teach the lookup table as claimed in claim 1, *Lee et al* wherein a mapper includes a subtree memory and a subtree mapper, the subtree mapper storing the partial indexes (*col.5 line 50-col.6 line 19, col.7 lines 5-30; Wilkinson III et al: col.27 line 44-col.28 line 13*).

h. **Per claim 25**, *Wilkinson III et al* and *Lee et al* teach the lookup table as claimed in claim 1, *Lee et al* further teach wherein the partial index includes a pointer to a subtree entry stored in another mapper (*col.7 lines 5-67, col.7 lines 30-57*).

**IV. Claims 4-7, 11-14 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wilkinson III et al* (US 6,014,659) in view of *Lee et al* (US 6,513,028) in further view of *Cao et al* (US 6,826,561).**

a. **Per claim 4**, *Wilkinson III et al* and *Lee et al* as applied above yet fail to explicitly teach the lookup table as claimed in Claim 3 wherein the search key includes a 32-bit IPv4 address. However *Cao et al* teach wherein the search key length includes a 32-bit IPv4 address (*col.3 lines 38-50*). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of *Wilkinson III et al* and *Lee et al* with *Cao et al* for the purpose of varying the length of the search key to include 32-bit IPv4 addresses, so that the searching functions are scaleable and applicable with the current and “next-generation” IP addresses.

b. **Claims 11 and 18** are substantially similar to claim 4 and are therefore rejected under the same basis.

c. **Per claim 5**, *Wilkinson III et al* and *Lee et al* with *Cao et al* teach the lookup table as claimed in Claim 3, *Lee et al* further teach wherein the route index corresponding to the search key is found after a first search of the plurality of mappers if the length of the search key is less than or equal to the length of a mapper key, and is found after multiple searches of the plurality of mappers if the length of the search key is greater than the length of the mapper key (*col.7 lines 30-65, col.8 lines 49-59*).

d. **Claims 12 and 19** are substantially similar to claim 5 and are therefore rejected under the same basis.

e. **Per claim 6**, *Wilkinson III et al* and *Lee et al* with *Cao et al* teach the lookup table as claimed in Claim 3, *Cao et al* further teach wherein the search key includes a 128-bit IPv6 address (*col.3 lines 45-50, col.7 lines 10-13*).

f. **Claims 13 and 20** are substantially similar to claim 6 and are therefore rejected under the same basis.

g. **Per claim 7**, *Wilkinson III et al* and *Lee et al* with *Cao et al* teach the lookup table as claimed in Claim 1, *Cao et al* further teach wherein the partial index is a subtree index (*col.3 lines 23-31, col.4 line 54-col.5 line 30; Lee et al: col.7 lines 5-67, col.7 lines 30-57*).

h. **Claims 14 and 21** are substantially similar to claim 7 and are therefore rejected under the same basis.

### Conclusion

V. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure: Marquis (5930805), Bates et al (6873982), Bass et al (6675163), Bui et al (6285994), Filepp et al (6199100), Lipman et al (6192051).

VI. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

**VII.** Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Kristie Shingles whose telephone number is 571-272-3888. The examiner can normally be reached on Monday-Friday 8:30-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on 571-272-3880. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

***Kristie Shingles***  
***Examiner***  
***Art Unit 2141***

***/KDS/***

***/William C. Vaughn, Jr./***

Supervisory Patent Examiner, Art Unit 2144